

Dart Aerospace Ltd

| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| | | | | | | | |
| | | | | | | | |

Part No: D6011-115 PAR #: _____ Fault Category: Supplier NCR: Yes No DQA: _____ Date: _____
 Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: <u>B60480</u> | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|--------------------|------|--|-----------------------------|--|----------------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| 11/9/11 | 170 | Found Qty x2 length of stroke extrusion with the centre of the tube not running concentric with the outside. | <u>JP</u> 11.07.11 | → inform Alunna of issue + review a cert. t. Attach all emails to w/o for ref. | <u>W</u> 11.07.08 | <u>W</u> 11/7/11 | <u>P</u> 11.07.11 | <u>S</u> 11/7/11 |
| | | R.C. not extracted correctly | <u>JP</u> 11.07.11 | → HOLD QTY (2) ECCENTRIC TUBES IN QUARANTINE. REMAINING BATCH ACCEPTABLE | <u>S</u> 11/7/11 | <u>W</u> 11.07.15 | <u>P</u> 11.07.11 | <u>S</u> 11/7/11 |
| | | | | | | | | |

NOTE: Date & initial all entries

I have got my gauge
Block Back from calibration
in March.

I cant do it till they
re retrieved.

Work Order ID 65180



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January 7, 2011 9:08:42 AM

| | | | | | |
|-------------------------------|------------------|--|---------------|-------|--|
| Item ID: D6011-115 | Accept | | Setup | Start | |
| Revision ID: | | | | Stop | |
| Item Name: Crosstube Material | | | | | |
| Start Date: 1/07/11 | Start Qty: 15.00 | | Cust Item ID: | | |
| Required Date: 5/02/11 | Req'd Qty: 15.00 | | Customer: | | |
| Reference: | | | | | |

| | | | | | | | |
|------------|---------------|-------|------------|-------|-----|-------|--|
| Approvals: | Process Plan: | Date: | Tooling: | Date: | Run | Start | |
| | QC: | Date: | SPC (Y/N): | Date: | | Stop | |

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|---|---|----------------------|--------------|--------|--------------|---------------|---------------|------------------|----------------|
| 130 HandFinish Hand Finishing | Chemical Conversion Coat per QSI005 4.1 Memo | 0.00 0.00 | | | | | | | |
| 140 Packaging Packaging | Identify as per dwg & Stock Location: <u>LG</u> Memo | 0.00 0.00 | | | | | | | |
| 150 QC Quality Control | QC21- Final Inspection - Work Order Release Memo | 0.00 0.00 | 11/07/12 | | | | | | |
| | | | | | | | | | |

11/7/15

W 11-07-13

Picklist Print

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Work Order ID: 65180



Parent Item: D6011-115



Parent Item Name: Crosstube Material

Start Date: 1/07/11

Required Date: 5/02/11

Start Qty: 15.00

Required Qty: 15.00

Comments: IPP Rev:A 01.08.17 ☐ New Issue ☐ SM
IPP rev B 07.09.18 rev A1 dwg EC verified by:JLM

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|

D6011-115P

Purchased

No

100

Each

0.0000

1

15



Crosstube Material

10/14/11

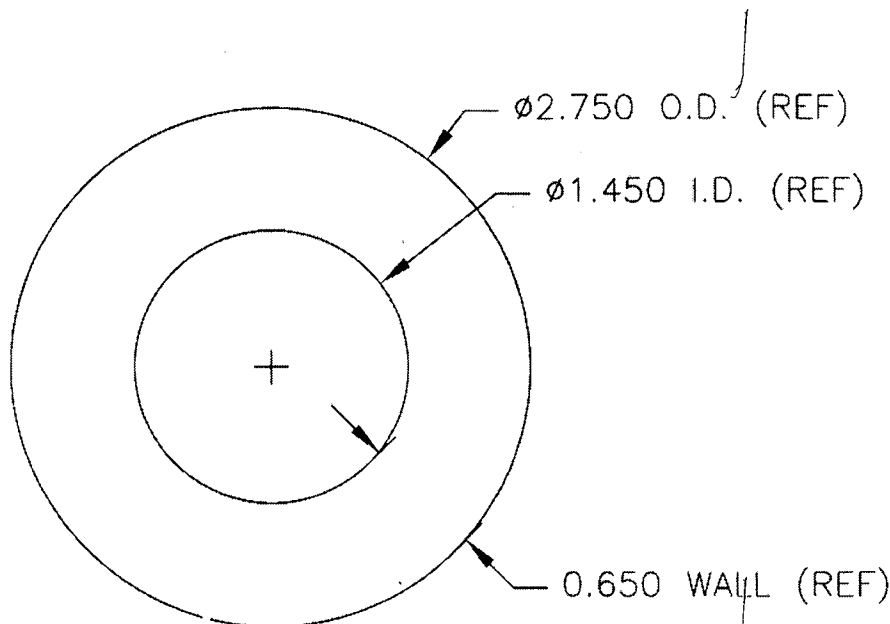


| | | | |
|------------------|----------------|---|------------------------|
| DESIGN # | DRAWN BY KF | DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA | |
| CHECKED # | APPROVED # | DRAWING NO. D6011 | REV. A SHEET 1 OF 1 |
| DATE 01.08.16 | | TITLE CROSSTUBE MATERIAL | SCALE 1:1 |
| A | 01.08.16 | NEW ISSUE | |
| A1 | 02-01-29 | UPDATE TOLERANCE ON OD | |

SPECIFICATION CONTROL DRAWING

RELEASED
01.08.17


info
65180



NOTES

- 1) D6011-XXX CROSSTUBE
LENGTH

WHERE XXX IS LENGTH IN INCHES
EG. 115" LONG TUBE: D6011-115

- 2) MATERIAL: 2.750 OD x 0.650 WALL 7075-T6/T6511 (WW-T-700/7 OR QQ-A-225/9 OR QQ-A-200/11) SEAMLESS ALUMINUM TUBE.
MINIMUM ULTIMATE TENSILE STRENGTH = 77 ksi
MINIMUM YIELD TENSILE STRENGTH = 66 ksi
- 3) TOLERANCES ARE PER ~~ASTM B210 AS FOLLOWS~~ *ANSI H35.2 AS FOLLOWS* 
O.D.: ~~± 0.006 MEAN (± 0.012 INCLUDING OVALITY)~~ *± 0.015 MEAN (± 0.030 INCL. OVALITY)*
WALL: ± 0.020 MEAN (± 0.065 INCLUDING ECCENTRICITY)
LENGTH: XXX +0.125/-0.000
STRAIGHTNESS: 0.010" DEVIATION / 12" LENGTH
- 4) EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- 5) CHEMICAL CONVERSION COAT PER DART QSI 005 4.1

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Packinglist ALUnna AG

| | |
|-----------------|-----------|
| ALUnna ref. no. | 3991872 |
| Customer PO. | PO. 13245 |
| Date: | 06.03.11 |

Boxmarking:

| |
|-------------------------------|
| Dart Aerospace PO. 13245 |
| D 6011-115 Made in Germany |
| Dest. Hawkesbury Ont., Canada |

We hereby declare that the wooden packing material are totally free from bark and apparently

free from live plant pests

[illegible]

Abnahmeprüfzeugnis 3.1 - DIN EN 10204:2005

Inspection Certificate 3.1 - DIN EN 10204:2005 / Certificat de Reception 3.1- DIN EN 10204:2005

Kunde: Dart Aerospace Ltd.
 Client: 1270 Aberdeen Street
 K6A1K7 Hawkesbury, ON Canada

Zeugnisnummer: 641/11
 Cert No.: / No. du certificat:
Bestellnummer: PO 13245
 Order No. / No. de commande
Auftrag: 39916/2
 Our Reference/Notre Reference:

Produkt: Rohre nahtlos gepresst
 Product / Produit: Tubes seamless extruded
Spezifikation: AMS - QQ - A - 200/11; Spezifikation Dart Aerospace D6011-XXX
 Specification:

Werkstoff: 7075
 Alloy/Alliage: **Zustand:** T6511
 Temper/État

Abmessung 2,750 INCH x 1,450 INCH x 0,650 INCH x 115,00 INCH
 Size / Dimension buff finish

Kennzeichnung ALUnna - Cert No. 641/11 - 7075 - T 6511 - Cast No. 5613 - AMS QQA 200/11 - 2.750" OD X 0.650" Wall - Heat Lot
 Marking/Marquage: No. 400782 - ALUnna Order Conf. No. 39916/2-1 PO. 13245

Lieferung Stück kg Products are in accordance with applicable RoHS
 Delivered Material / Matériel délivré: 16 363,00

1. Chemische Analyse Chemical Analysis / analyse chimique

Elemente ohne Grenzwerte:
 einzeln max. 0,05 %, insgesamt 0,15 %

| | Si | Fe | Cu | Mn | Mg | Cr | Zn | Ti | Pb | Zr | Bi | Sn | Ni |
|---------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|--------|--------|--------|
| Charge/ min. | | | 1,2 | | 2,1 | 0,18 | 5,1 | | | | | | |
| Cast No. max. | 0,40 | 0,50 | 2,0 | 0,30 | 2,9 | 0,28 | 6,1 | 0,20 | | | | | |
| 5613/11 | 0,093 | 0,187 | 1,531 | 0,049 | 2,416 | 0,214 | 5,888 | 0,032 | 0,003 | 0,0381 | 0,0001 | 0,0016 | 0,0050 |

2. Mechanische Eigenschaften Mechanical Properties / Valeurs Mécaniques

| Anforderungen Requirements | tensile (Rm) ksi | yield (Rp0,2) ksi | elongation 2" % | elongation A % | Hardness HB | Heat Lot No. |
|-------------------------------|---------------------|----------------------|--------------------|-------------------|----------------|--------------|
| min. | 77,0 | 66,0 | | | | |
| max. | | | | | | |
| 1 | 86,420 | 79,170 | 10,0 | | 167,0 | 400782 |
| 2 | 85,550 | 78,010 | 10,0 | | 173,0 | |
| | | | 8140714 | | | |

RMS outside 25 - max. 14,0 µ"

Ergebnis der Prüfungen: Es wird bestätigt, daß die Lieferung geprüft wurde und den Vereinbarungen bei der Bestellannahme entspricht

Test results: We confirm that the delivery has been tested and applies to the agreements made on receipt of the order

Resultats: Nous confirmons que la livraison a été contrôlée et correspond avec les conventions faites à la réception de la commande

01.06.2011 / merg



Certified acc. DIN EN ISO 9001:2000 and DIN EN 9100:2003
 valid until 2010-11-11
 Cert.- Reg. No.: 001959 QM; 001959 ASH



Abnahmebeauftragter

Aluminiumwerk Unna AG, Uelzener Weg 36, 59425 Unna, Germany

13

148

Hi,

Please see attached photos of two non-conforming tubes that arrived this week, and let me know how you would like to proceed.

Thank You,

Linda

From: Eric Downing [mailto:edowning@dartaero.com]

Sent: July 8, 2011 3:00 PM

To: Bill Beckett; Linda Lacelle; Susanne Sheldon; 'David Shepherd'; 'Mike Petsche'; Eric Charbonneau; 'JEANLUC MENARD'; Chantal Lavoie

Cc: Marc Bellavance; Chris Provencal

Subject: FW: Eccentric Tube

Hello all

I found this qty 2 tubes with one end of each not true to the outside. This is a new batch that just arrived this week.

Linda/Chantal

You need to inform Aluna of the issue and to see where to go next.

The whole batch is red tagged and the two non-conforming tubes are on the quarantine rack until further notice.

From: Chris Provencal [mailto:cprovencal@dartaero.com]

Sent: July 8, 2011 2:46 PM

To: 'Eric Downing'

Subject: Eccentric Tube

Attached.

-Chris

Linda Lacelle

From: Chris Provencal <cprovencal@dartaero.com>
Sent: July 11, 2011 12:13 PM
To: 'Linda Lacelle'; 'Kaustraeter, Gregor'; 'Eric Downing'
Cc: 'Johnston, Kerstin'; 'Better, Claus'
Subject: RE: Eccentric Tube
Attachments: CCF11072011_00000 (2).jpg; CCF11072011_00000.jpg

Gregor,

We were premature in declaring the tubes as non-conforming. The wall measurements are -0.002" mean wall thickness, -0.053" max eccentricity, which is within the tolerances of ANSI H32.2, (+/-0.020 mean wall thickness, +/-0.065 including eccentricity). I've attached the wall thickness measurements for reference.

The only question I would have: are the tubes checked for wall thickness in the middle for wall thickness? These were noticeable because the eccentricity of the I.D. occurred at the end, if it had been in the middle of the tube it wouldn't be readily apparent.

Regards,

Christopher Provencal
DART Aerospace Ltd.
cprovencal@dartaero.com
Tel: (613) 632 5200
Fax: (613) 632 9311

From: Linda Lacelle [mailto:llacelle@dartaero.com]
Sent: Monday, July 11, 2011 10:47 AM
To: 'Kaustraeter, Gregor'; 'Eric Downing'; Chris Provencal
Cc: 'Johnston, Kerstin'; 'Better, Claus'
Subject: RE: Eccentric Tube

Hi,
Erci/Chris, could you please provide Gregor with this information.
Thx
L

From: Kaustraeter, Gregor [mailto:Gregor.Kaustraeter@alunnatubes.com]
Sent: July 11, 2011 3:16 AM
To: Linda Lacelle
Cc: Johnston, Kerstin; Better, Claus
Subject: AW: Eccentric Tube

Good morning Linda,

I apologize for the problems. Could you please confirm that the tubes are from our P/O 39916/2 (cert. no. 641/11)? Did you measure the min. and max. wall thicknesses? Could you please let me know your readings?

Gregor

Dr. Gregor Kaustraeter
Quality Director
Aluminiumwerk Unna AG
Uelzener Weg 36
D 59425 Unna
Germany

Tel +49(0)2303/206-170
Fax +49(0)2303/206-117
Mobile +49(0)175/5 269 149
Email gregor.kaustraeter@alunnatubes.com
Internet <http://www.alu-unna.de>

Amtsgericht Hamm, HRB 3045
Vorstand: Volker Findeisen
Vorsitzender des Aufsichtsrates: Thomas Wiese

Von: Linda Lacelle [<mailto:llacelle@dartaero.com>]
Gesendet: Freitag, 8. Juli 2011 22:42
An: Better, Claus
Cc: Kaustraeter, Gregor; Johnston, Kerstin
Betreff: RE: Eccentric Tube

Thanks a bunch!
Linda

From: Better, Claus [<mailto:Claus.Better@alunnatubes.com>]
Sent: July 8, 2011 3:21 PM
To: Linda Lacelle
Cc: Kaustraeter, Gregor; Johnston, Kerstin
Subject: FW: Eccentric Tube

Good afternoon Linda,
I've forwarded your mail and the attachment to Gregor in Germany and he'll contact you about further proceedings.
I'll be travelling the next 2 weeks so please keep me in the loop.

Best regards.

Claus J. BETTER
President
ALUnna Tubes USA Inc.
3033 South Parker Road
Suite 630
AURORA CO 80014
phone: (303) 755-5672
fax: (303) 755-5936
cell: (303) 564-0828

From: Linda Lacelle [<mailto:llacelle@dartaero.com>]
Sent: Friday, July 08, 2011 1:15 PM
To: Better, Claus
Cc: Johnston, Kerstin; Eisenblaetter, Petra; 'Eric Downing'; Susanne Sheldon
Subject: FW: Eccentric Tube